

WHAT I CLAIM IS:

1. A multi port air filter for use in conjunction with an air intake system of an internal combustion engine comprising:

an outside filter screen;

5 a foam filter;

an inside filter screen;

a mesh filter;

a filter support plate; and

a housing comprising,

10 a main housing;

a housing grommet; and

a clamp.

2. The multi port air filter of claim 1 wherein the main housing has a plurality of protrusions with each protrusion having a fastener opening and wherein the main 15 housing includes a generally cone-shaped portion and a generally cylindrical portion.

3. The multi port air filter of claim 2 wherein the housing has at least one opening located in the cone shaped portion.

4. The multi port air filter of claim 3 wherein the generally cylindrical portion comprises a plurality of alternating curved flanges and curved openings.

20 5. The multi port air filter of claim 4 wherein the filter support plate is generally washer shaped and has a plurality of openings, the openings being sized and located to match the fastener openings of the main housing.

6. The multi port air filter of claim 5 wherein the housing grommet is generally ring shaped and is configured to fit within the opening of the generally cylindrical shaped portion of the main housing.

7. The multi port air filter of claim 6 wherein the housing grommet has an 5 inside circumferential surface having an inside diameter sized to fit an outside surface of an air intake tubing of a gasoline engine, the inside diameter, being sized such that when the multi port filter is installed, entrance of air between the inside circumferential surface and the outside diameter of the air intake tubing is minimized.

8. The multi port air filter of claim 7 wherein the housing grommet has a 10 plurality of indented surfaces on its outer circumferential surface.

9. The multi port air filter of claim 8 wherein the plurality of indented surfaces are located and shaped to match the location and shape of the plurality of alternating curved flanges and curved openings in the main housing.

10. The multi port air filter of claim 9 wherein the radial depth of the plurality of 15 indented surfaces in the housing grommet is such that the main housing can be installed over the housing grommet such that there is a slight interference fit between the inner surfaces of the curved flanges of the main housing and the plurality of indented surfaces, the slight interference fit resulting in a snug fit between the inside circumferential surface and the outside surface of the air intake tubing after the housing 20 grommet and the main housing have been installed over the air intake tubing and the clamp has been positioned and tightened over the housing grommet.

11. The multi port air filter of claim 10 wherein the outside filter screen is shaped to match the outside shape and configuration of the foam filter, the outside filter having a plurality of air openings.

12. The multi port air filter of claim 11 wherein the outside filter screen is
5 manufactured from a material chosen from the group consisting of steel, aluminum, plastic, ceramic, composite carbon, or rigid cloth.

13. The multi port air filter of claim 12 wherein the sizes and shapes of the outside filter screen, the foam filter, and the inside filter screen are such that, when these components are assembled, the foam filter and the inside filter screen are
10 encapsulated within the outside filter screen and are held in place by the friction existing between the contacting surfaces of the outer filter screen, the foam filter, and the inside filter screen 4.

14. The multi port air filter of claims 13 wherein the inside filter screen 4 is manufactured from a material chosen from the group consisting of steel, aluminum,
15 plastic, ceramic, composite carbon, or rigid cloth.

15. The multi port air filter of claim 14 wherein the general shape of the outer filter screen, the foam filter, and the inside filter screen is in the general form of a shape selected from the group consisting of a sphere, a cylinder, a cone, a frustocone, or a mushroom.

20 16. The multi port air filter of claim 15 wherein the foam filter is made from a flexible reticulated polyurethane foam material.

17. The multi port air filter of claim 16 wherein the plurality of air openings within the material used to make the outside filter screen and the inside filter screen are one of either a square shape, a diamond shape, a hexagon shape, or a circular shape.

18. The multi port air filter of claim 17 wherein the inside filter screen is in the 5 form of a generally frustoconically shaped cup and is sized to fit inside the foam filter.

19. The multi port air filter of claim 18 wherein the outside filter screen is a generally frustoconically shaped cup with an opening in the bottom sized to accept the foam filter with little or no clearance.

20. The multi port air filter of claim 19 wherein the foam filter is a generally 10 frustoconically shaped cup sized such that the closed end of the cup will fit within the outside filter screen and the open end of the cup will fit around the outside surface of the inside filter screen.

21. The multi port air filter of claim 20 wherein the foam material is washable, has a three dimensional cellular structure and is operable within the temperature range 15 of from about +225 degrees Fahrenheit to about -40 degrees Fahrenheit.

22. The multi port air filter of claim 21 wherein the mesh filter is made from a metallic screen material having a wire about 0.015 inches thick.

23. The multi port air filter of claim 22 wherein the multi port air filter has an air flow rate of at least 227 cubic feet per minute.

24. The multi port air filter of claim 23 wherein the multi port air filter filters out debris having a size of at least 25 microns.

25. A process of using a multi port air filter for filtering air in conjunction with an air intake system of an internal combustion engine comprising the steps of:

- providing an outside filter screen;
- providing a foam filter;
- providing an inside filter screen;
- providing a mesh filter;
- 5 providing a filter support plate;
- providing a housing, the housing comprising a main housing, a housing grommet; and a clamp;
- assembling the outside filter screen, the foam filter, the inside filter screen, the mesh filter, and the filter support plate onto the housing; and
- 10 installing the above components onto a component of an air intake system of a fuel injected engine.

26. The process of claim 25 wherein the assembled multi port air filter has an air flow rate of at least 227 cubic feet per minute and is capable of filtering debris having a size of at least 25 microns.

15